

FIG. 1

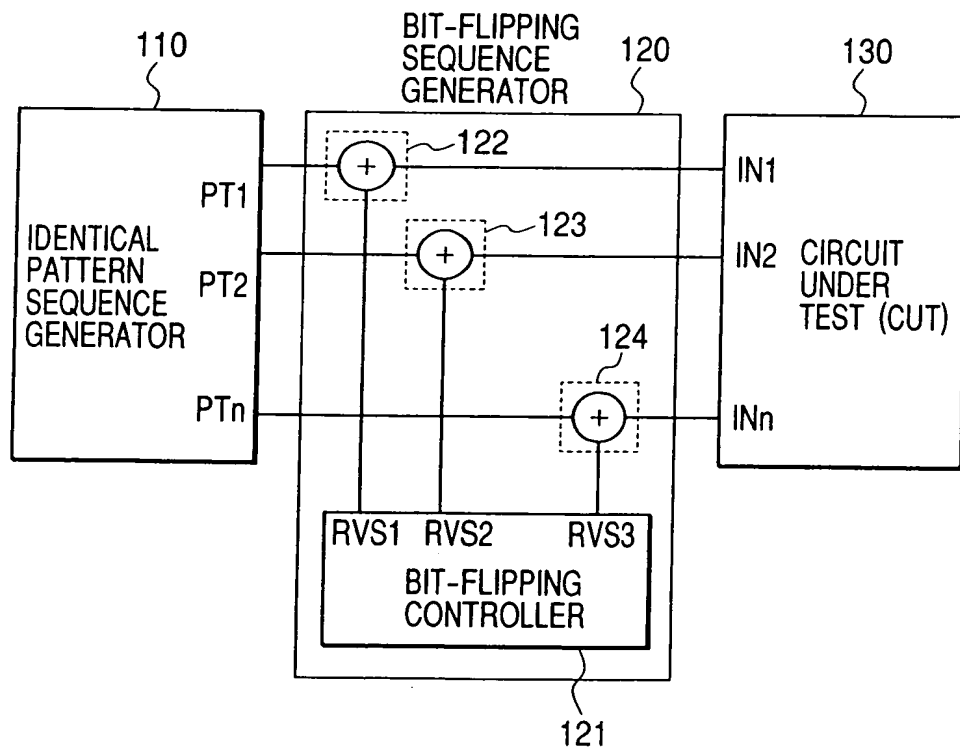


FIG. 2(b)

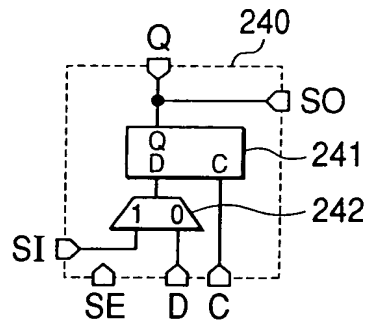


FIG. 2(c)

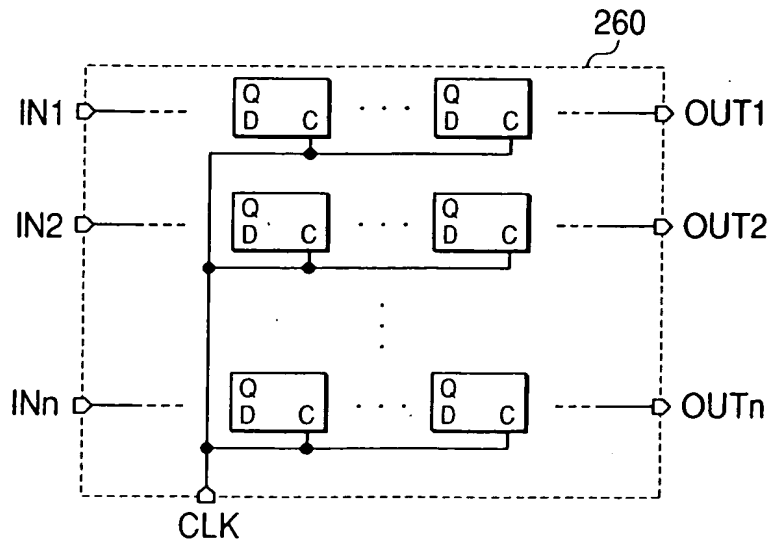


FIG. 3

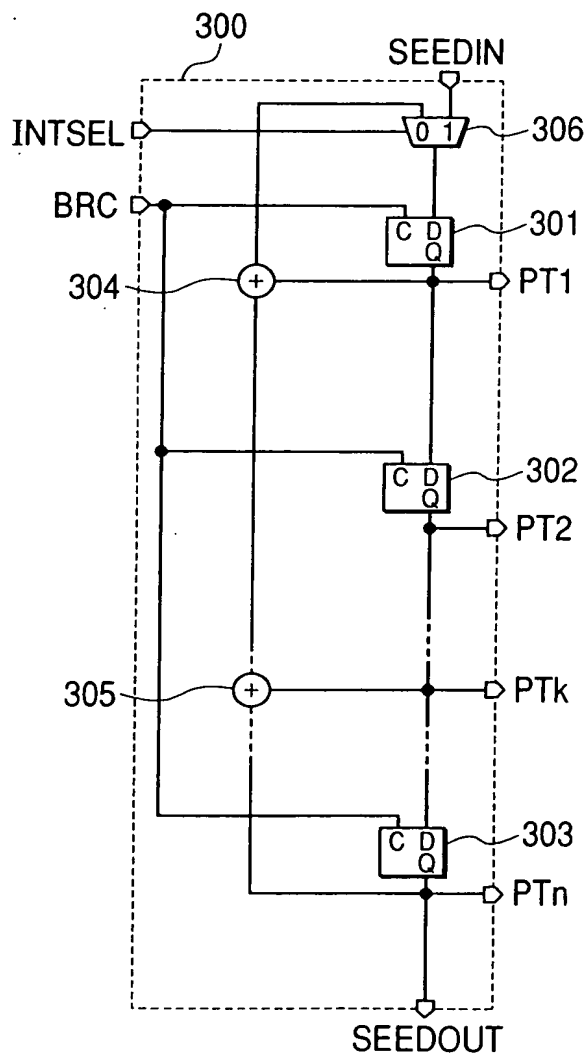


FIG. 4

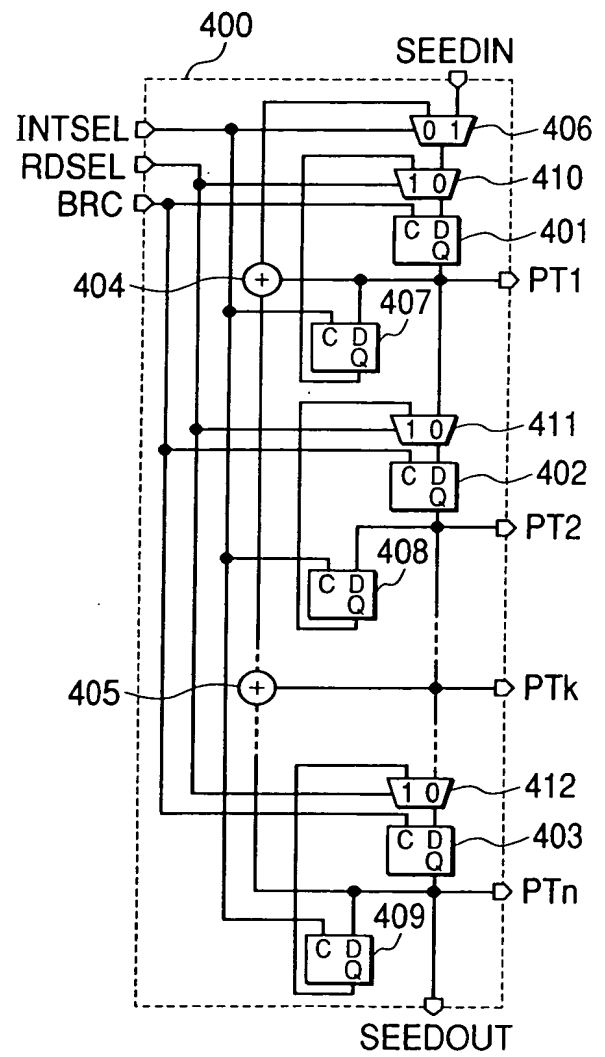


FIG. 5

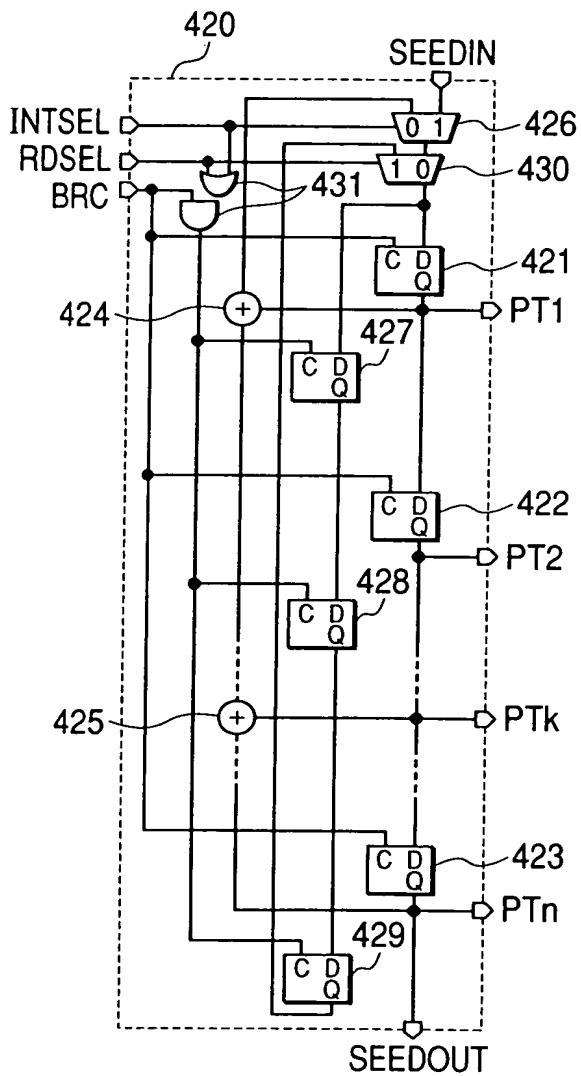


FIG. 6

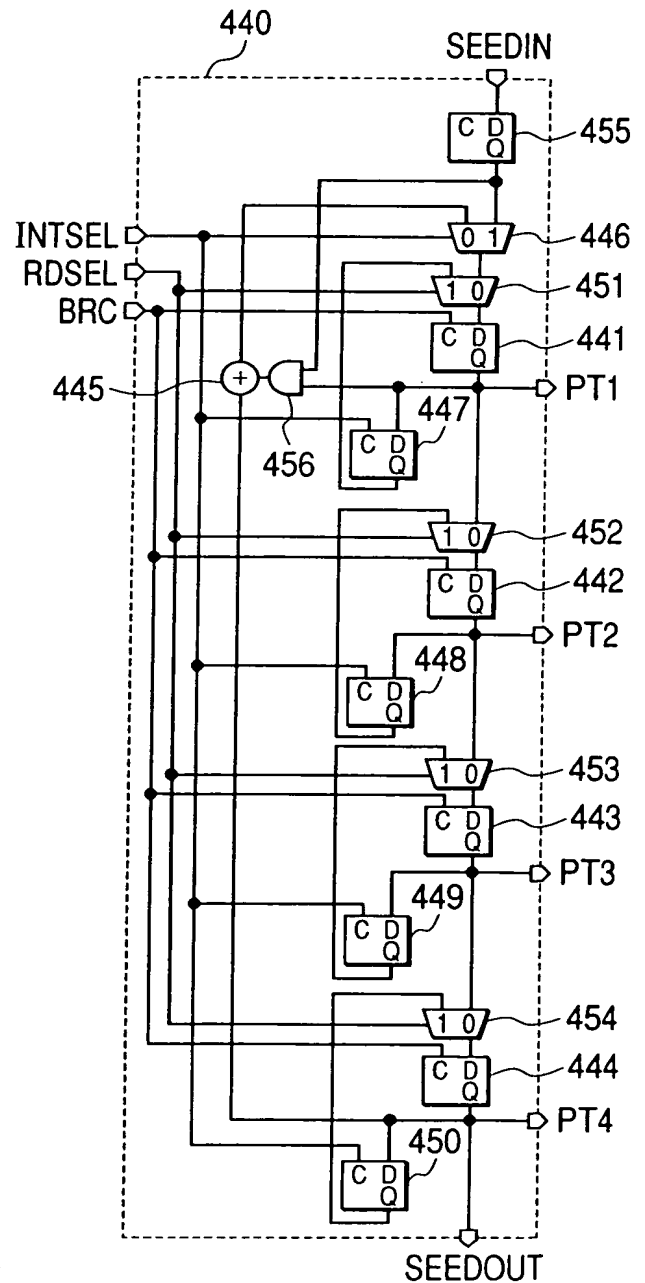


FIG. 7

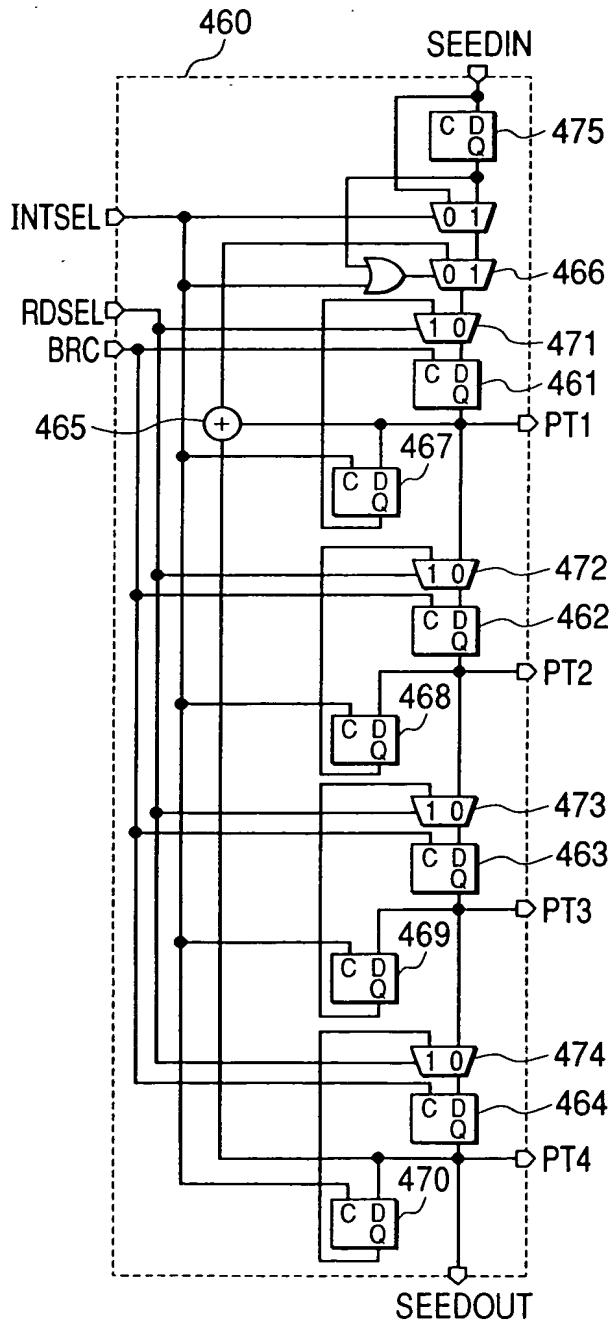


FIG. 8

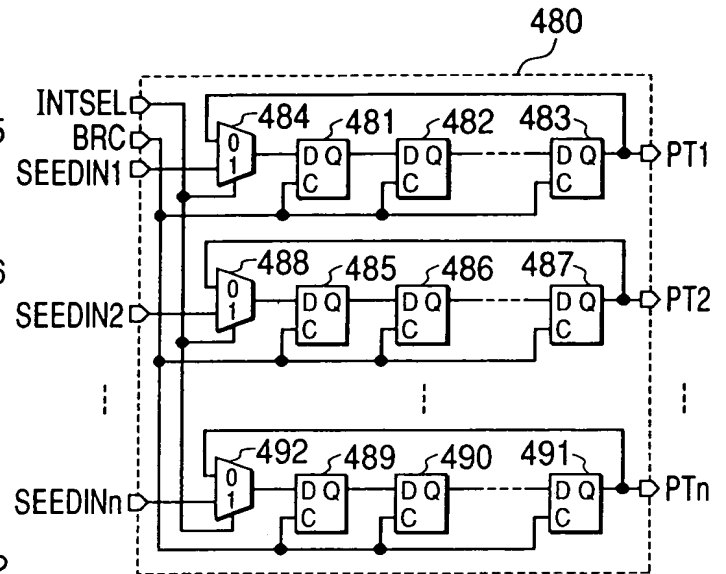


FIG. 9(a)

| MODE | INTSEL | BRC | REGISTER |
|--------------------|--------|-----|----------|
| INITIALIZATION | 1 | ⌋↑ | SHIFT |
| PATTERN GENERATION | 0 | ⌋↑ | RANDOM |

FIG. 9(b)

| MODE | INTSEL | RDSEL | BRC | REGISTER | SEED BACKUP REGISTER |
|--------------------|--------|-------|-----|----------|----------------------|
| INITIALIZATION | 1 | 0 | ⌋↑ | SHIFT | SEED COPY |
| PATTERN GENERATION | 0 | 0 | ⌋↑ | RANDOM | HOLD |
| SEED RECOVERY | 0 | 1 | ⌋↑ | RECOVERY | HOLD |
| SEED UPDATE | 1 | 0 | — | — | SEED COPY |

FIG. 9(c)

| MODE | INTSEL | RDSEL | BRC | REGISTER | SEED BACKUP REGISTER |
|--------------------|--------|-------|-----|----------|----------------------|
| INITIALIZATION | 1 | 0 | ⌋↑ | SHIFT | SEED COPY |
| PATTERN GENERATION | 0 | 0 | ⌋↑ | RANDOM | HOLD |
| SEED RECOVERY | — | 1 | ⌋↑ | RECOVERY | HOLD |

FIG. 10

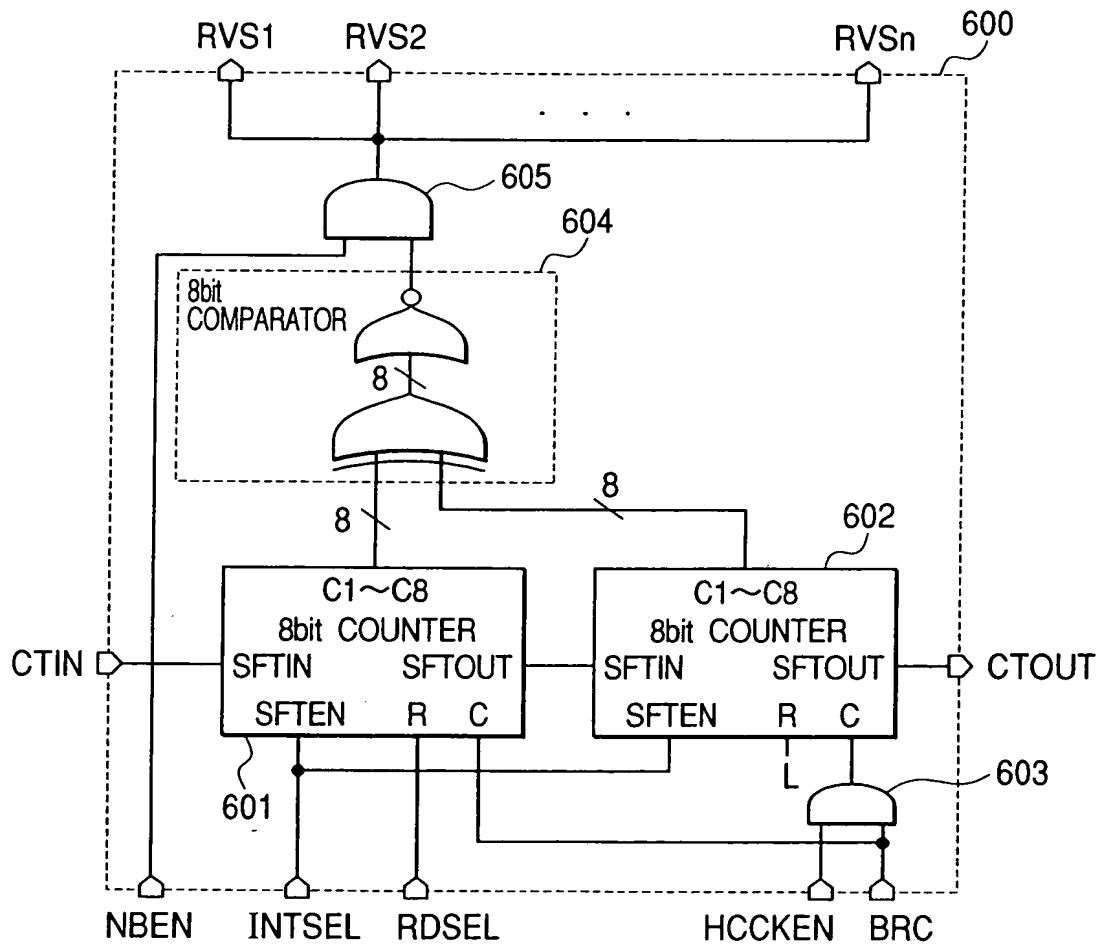


FIG. 11

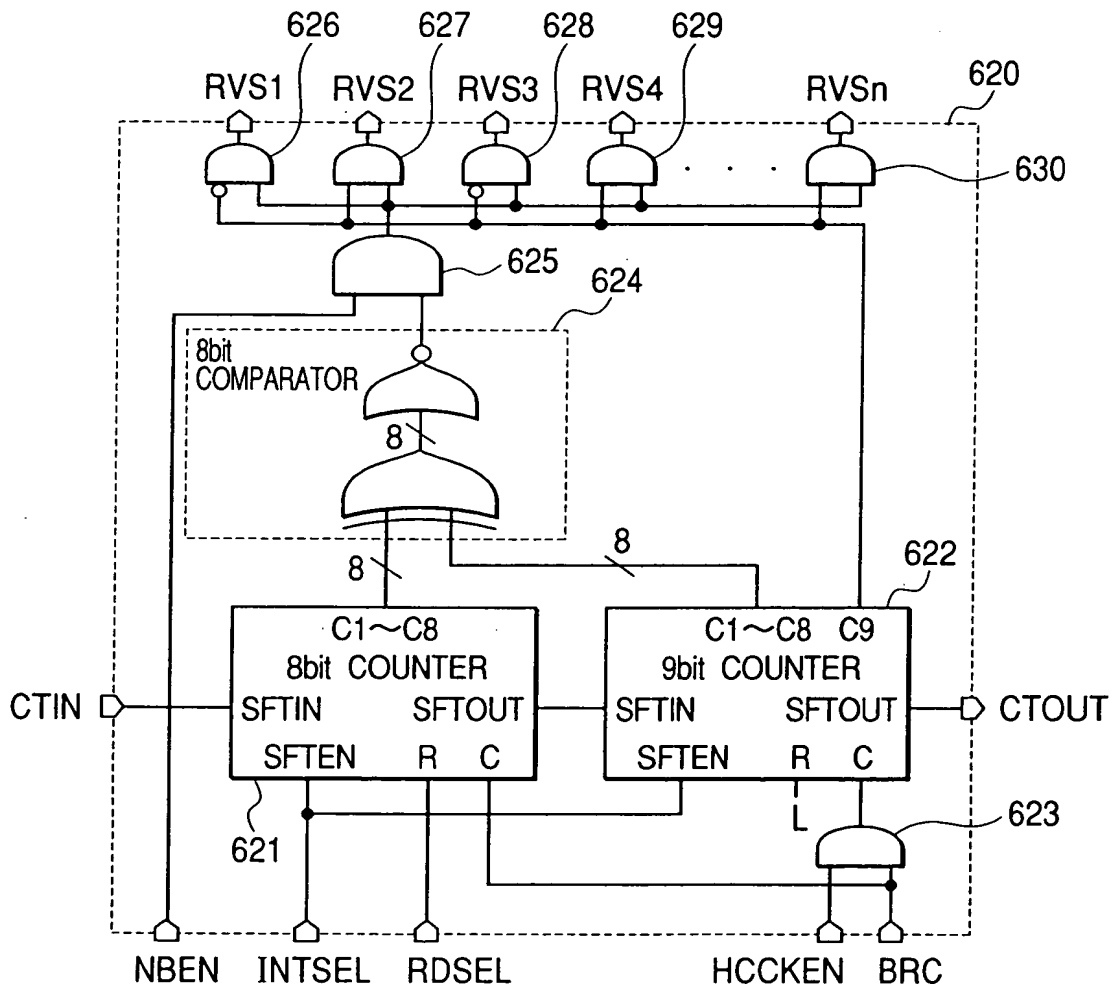


FIG. 12

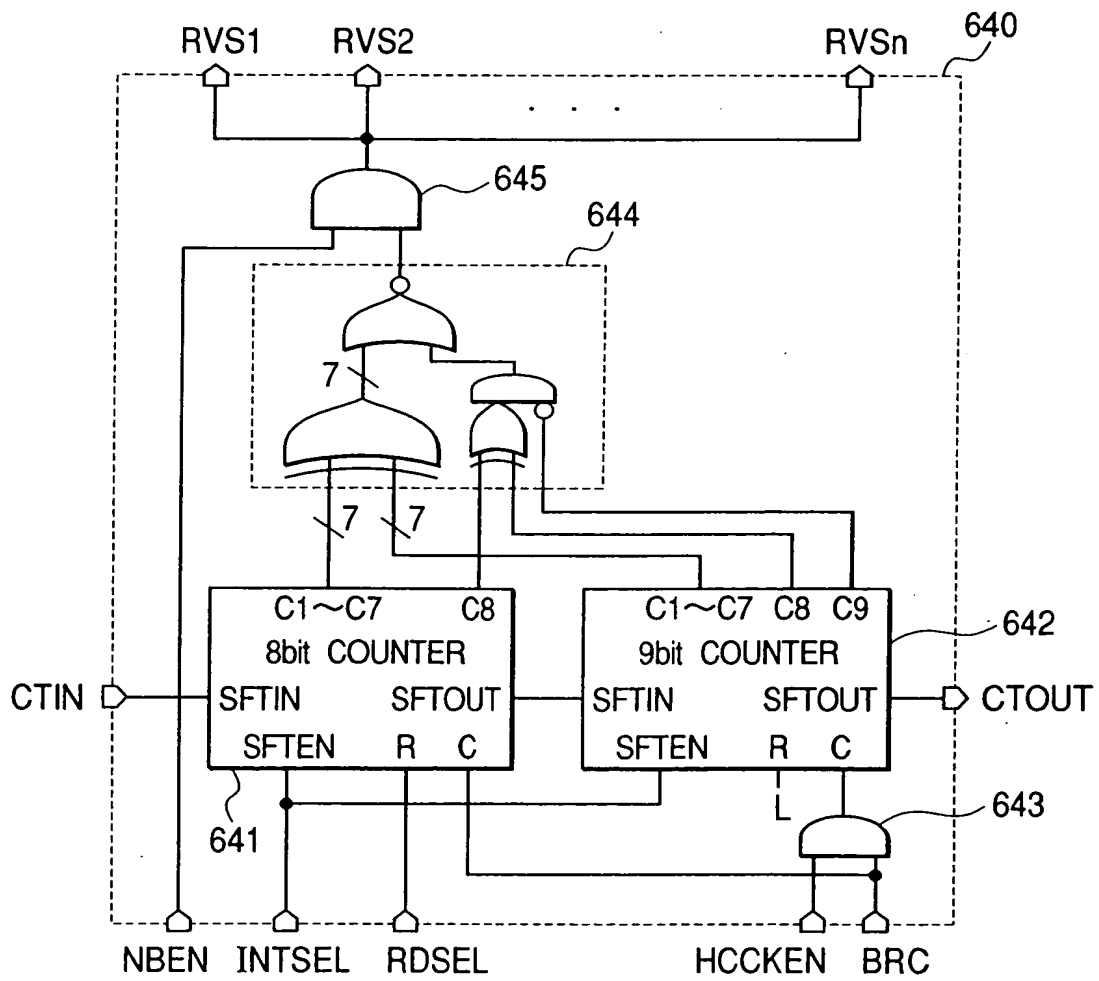


FIG. 14(a)

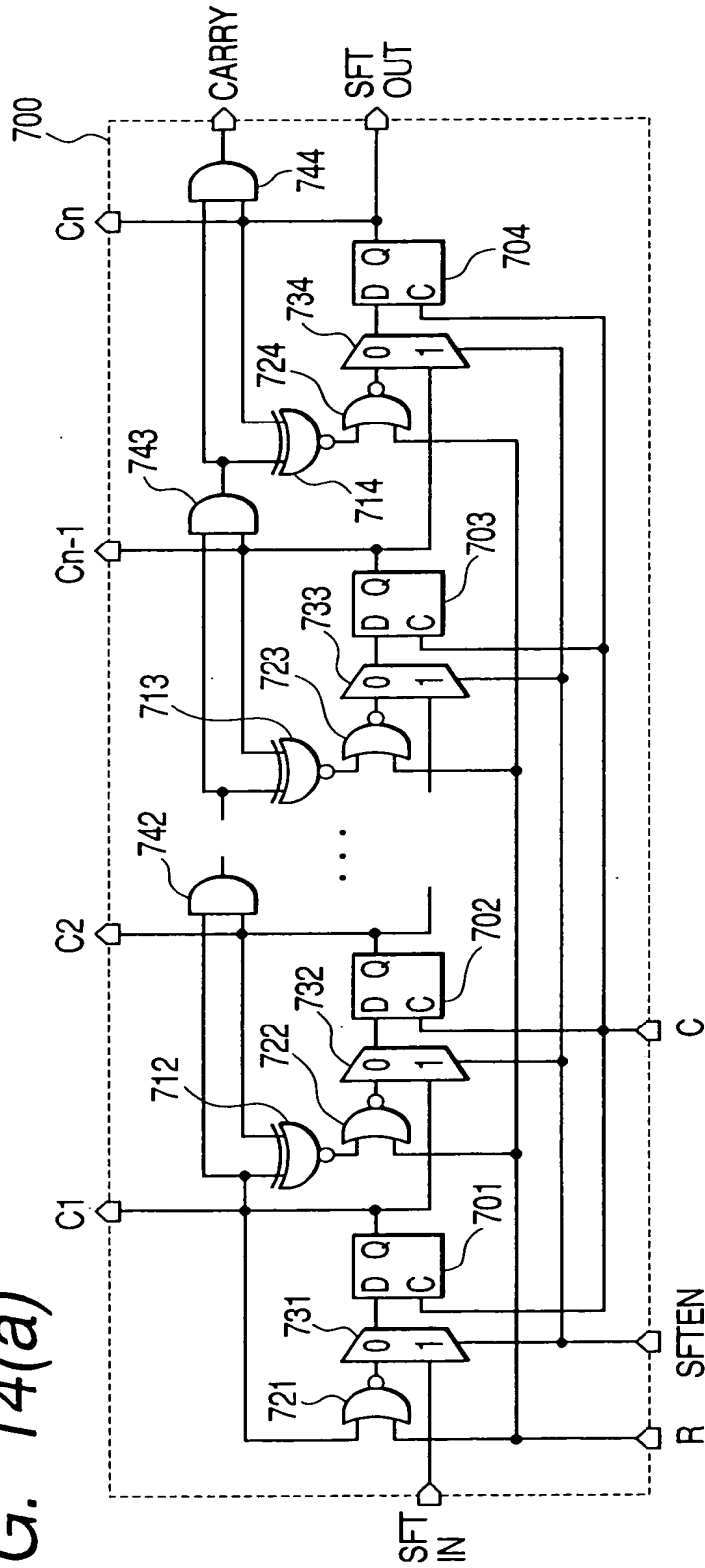


FIG. 14(b)

| MODE | SFTEN | R | C |
|-----------|-------|---|---|
| SHIFT | 1 | 0 | ↑ |
| RESET | 0 | 1 | ↑ |
| INCREMENT | 0 | 0 | ↑ |

FIG. 15(a)

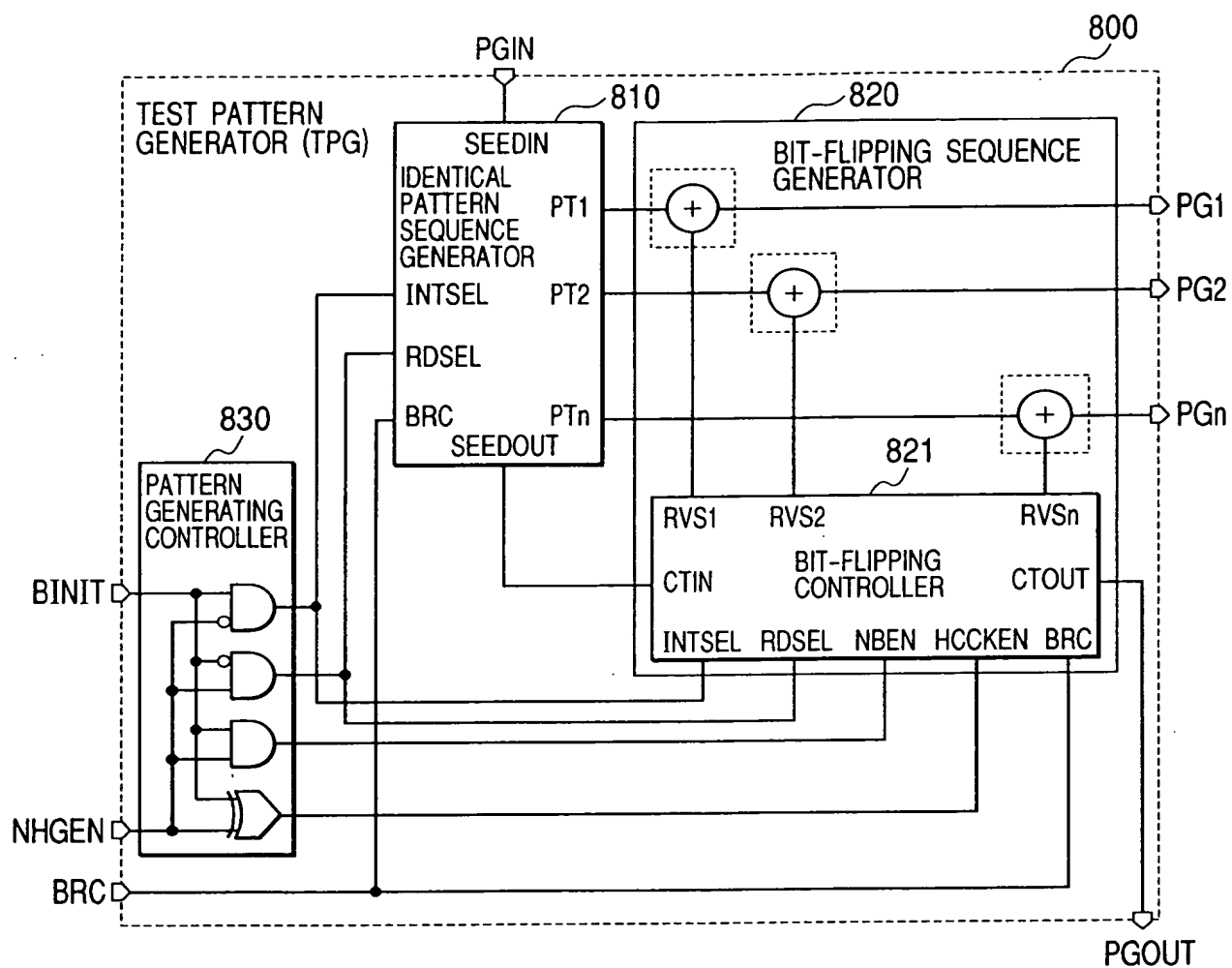


FIG. 15(b)

| | MODE | BINIT | NHGEN | INTSEL | RDSEL | NBEN | HCCKEN |
|-----|---------------------------------|-------|-------|--------|-------|------|--------|
| 841 | INITIALIZATION | 1 | 0 | 1 | 0 | 0 | 1 |
| 842 | PATTERN GENERATION | 0 | 0 | 0 | 0 | 0 | 0 |
| 843 | SEED RECOVERY | 0 | 1 | 0 | 1 | 0 | 1 |
| 844 | NEIGHBORHOOD PATTERN GENERATION | 1 | 1 | 0 | 0 | 1 | 0 |

FIG. 16

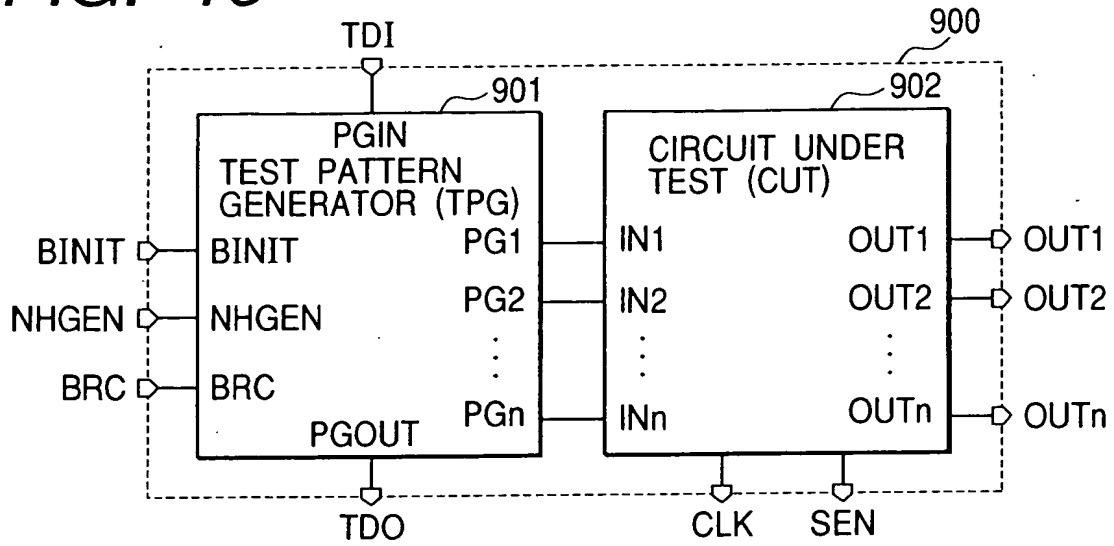


FIG. 17

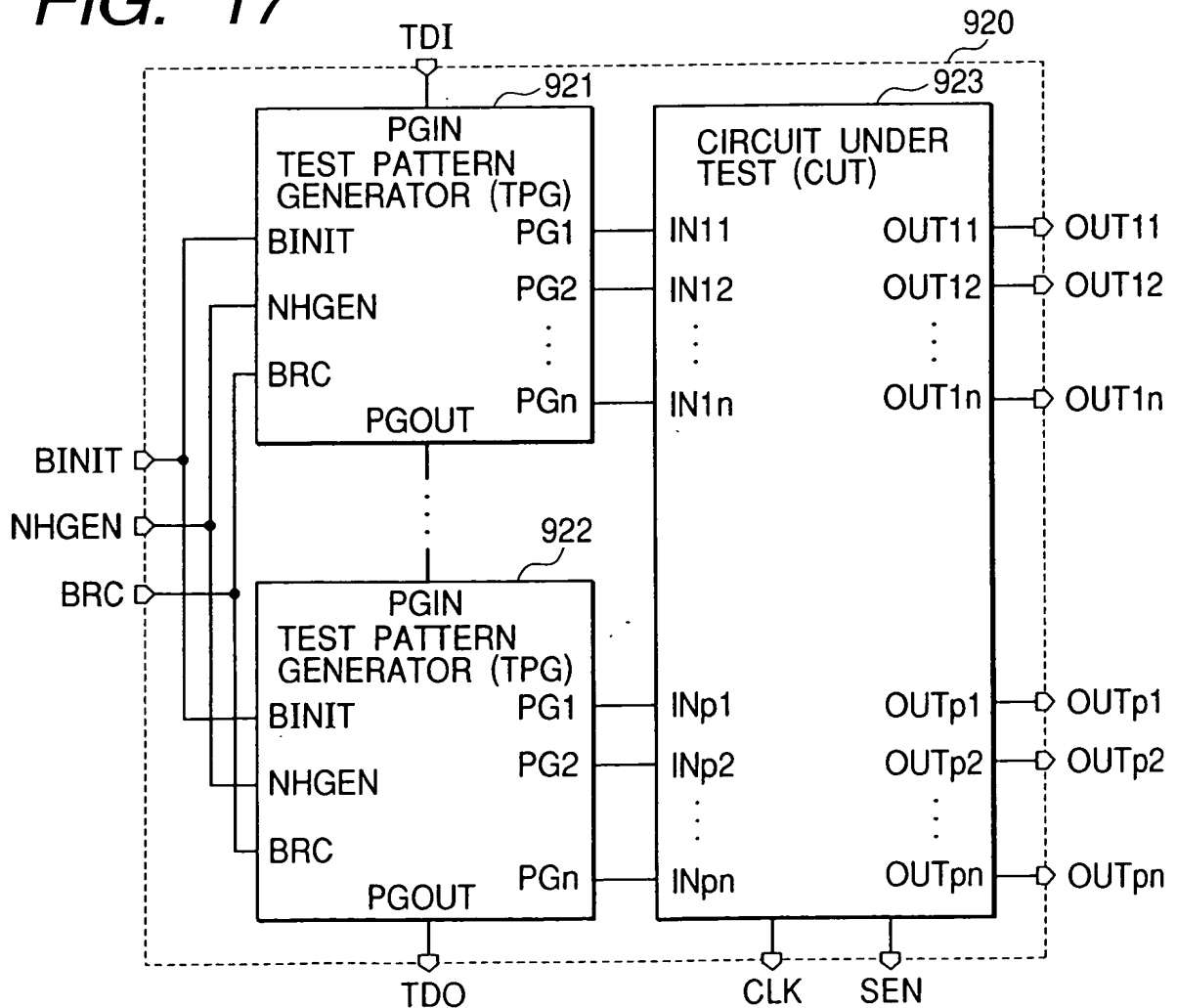


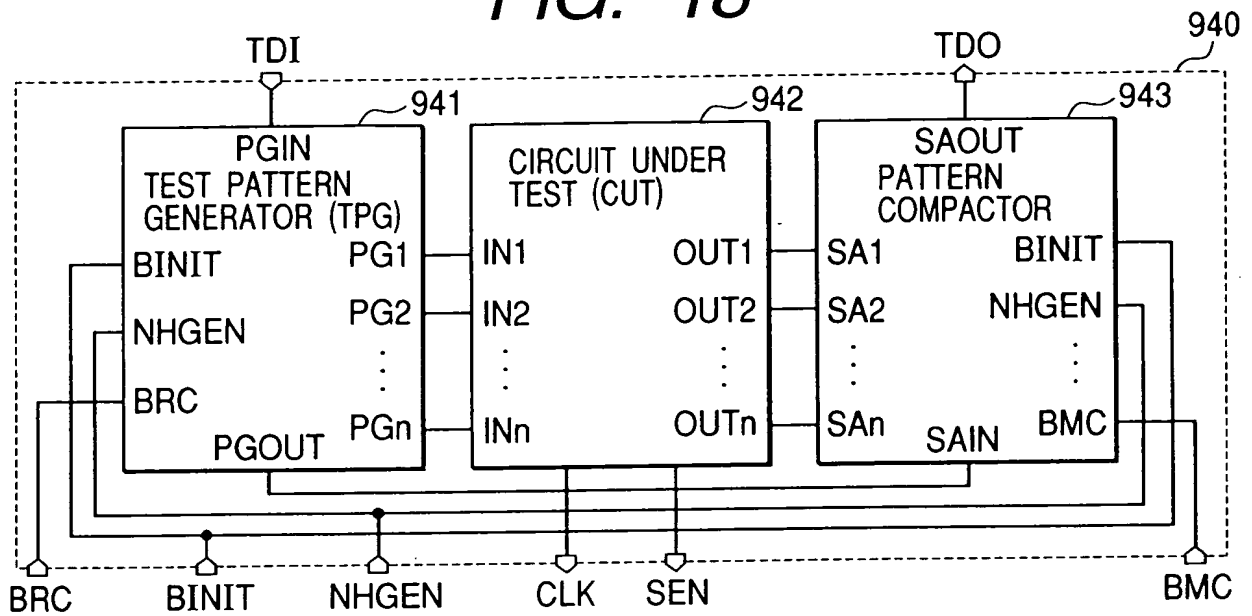
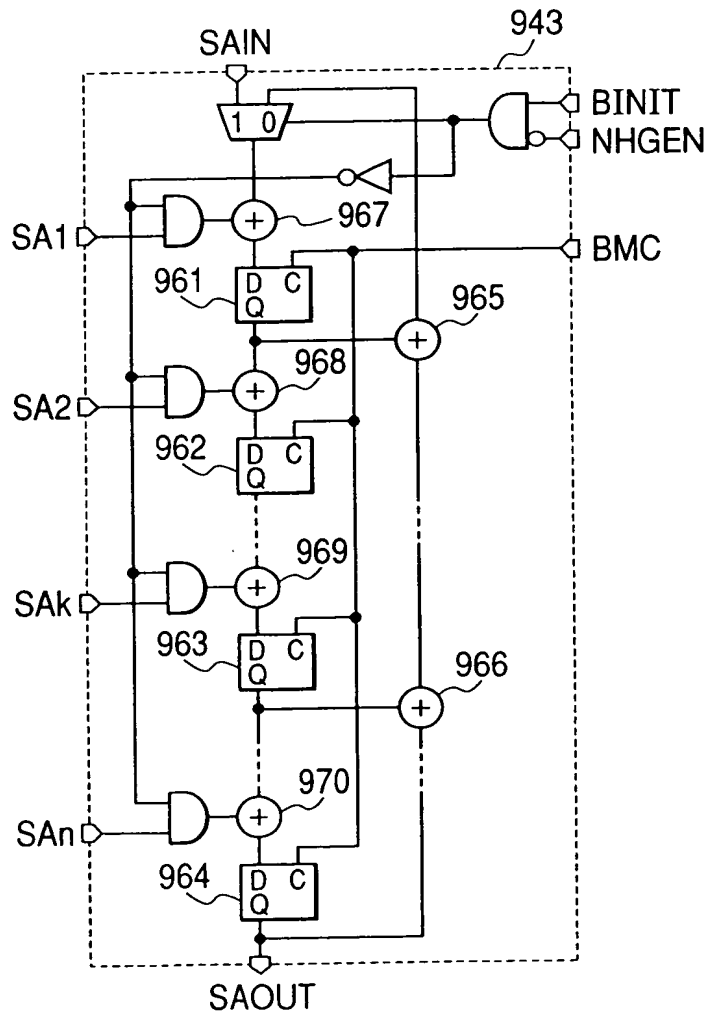
FIG. 18**FIG. 19**

FIG. 20

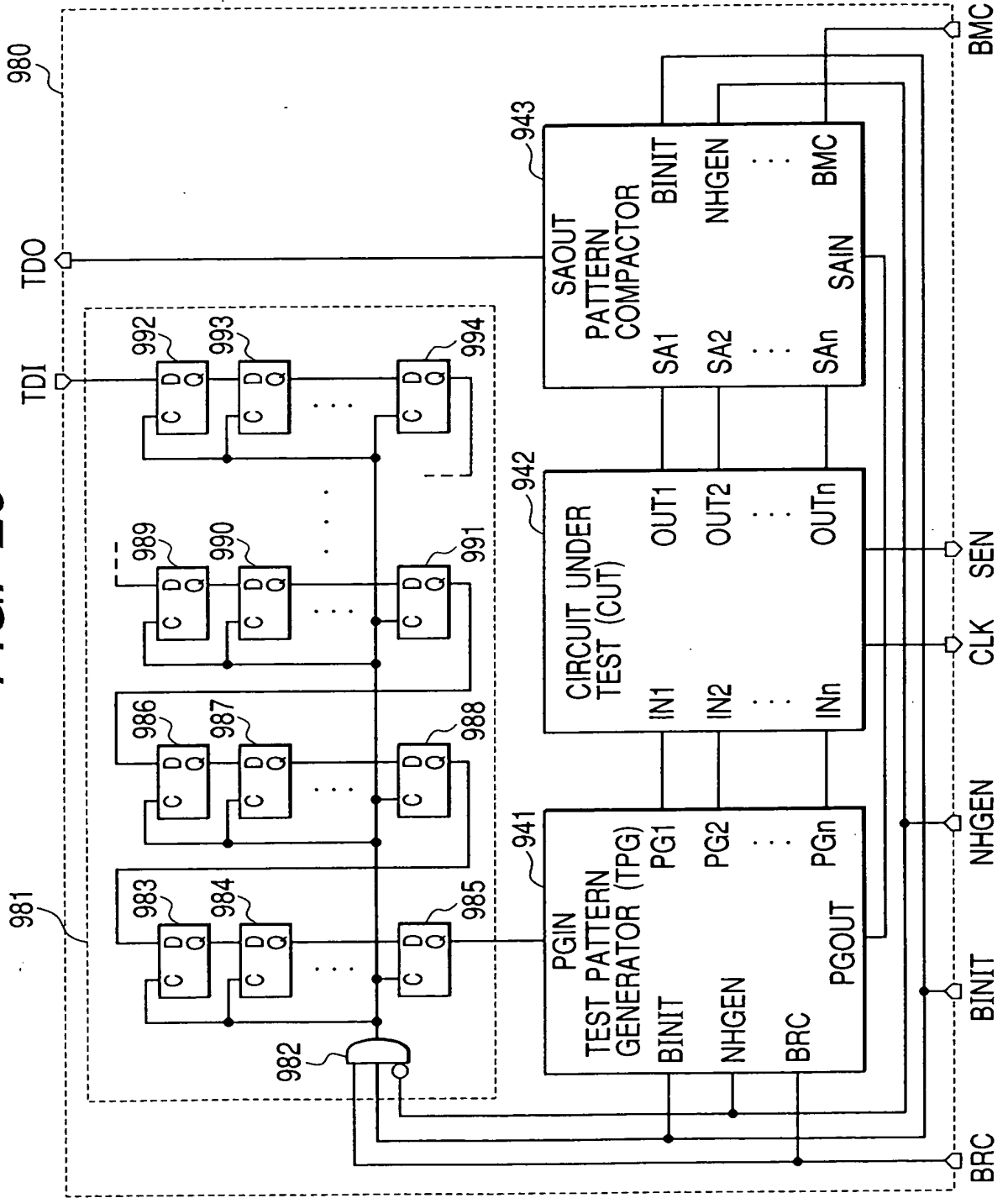


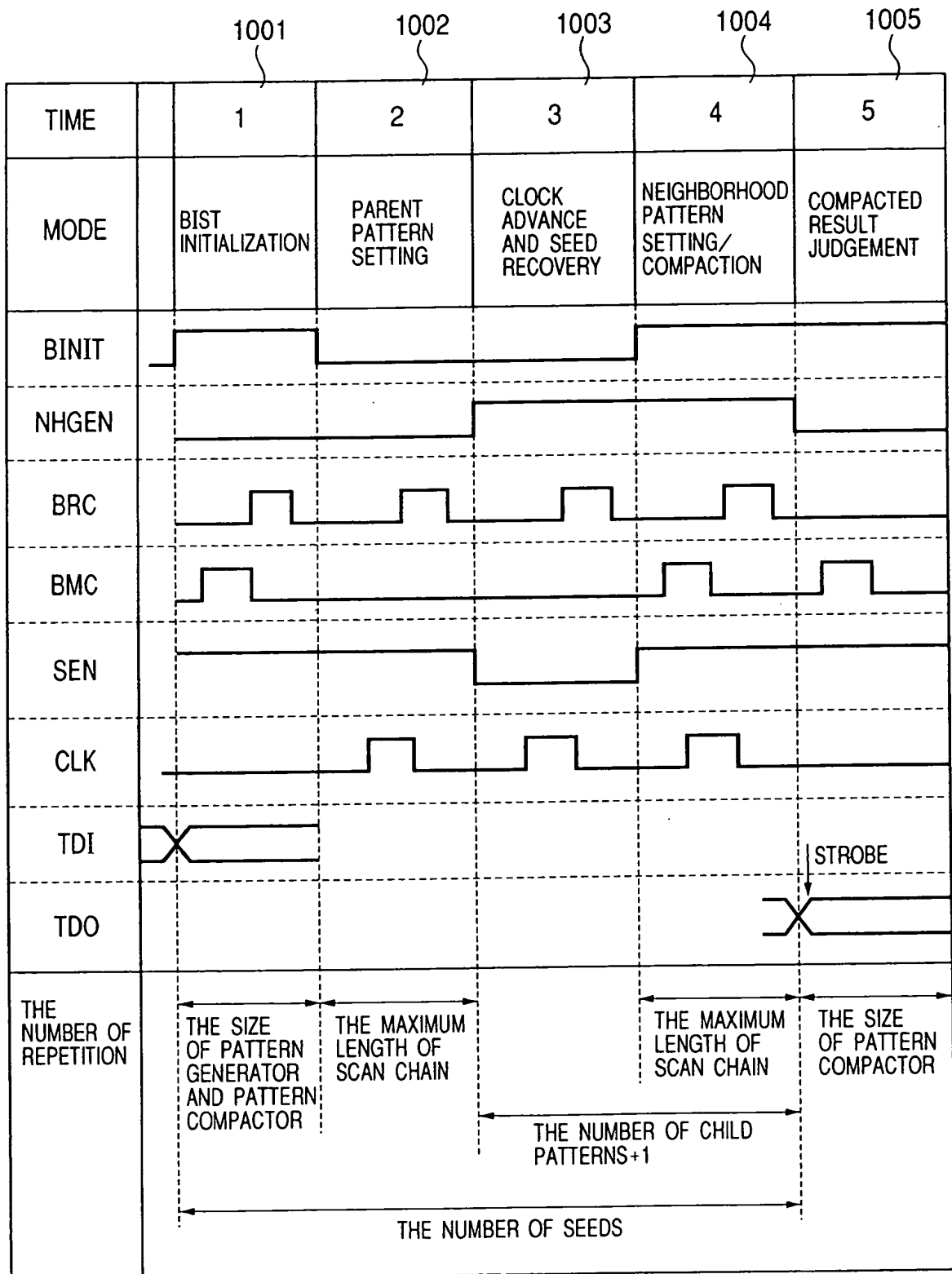
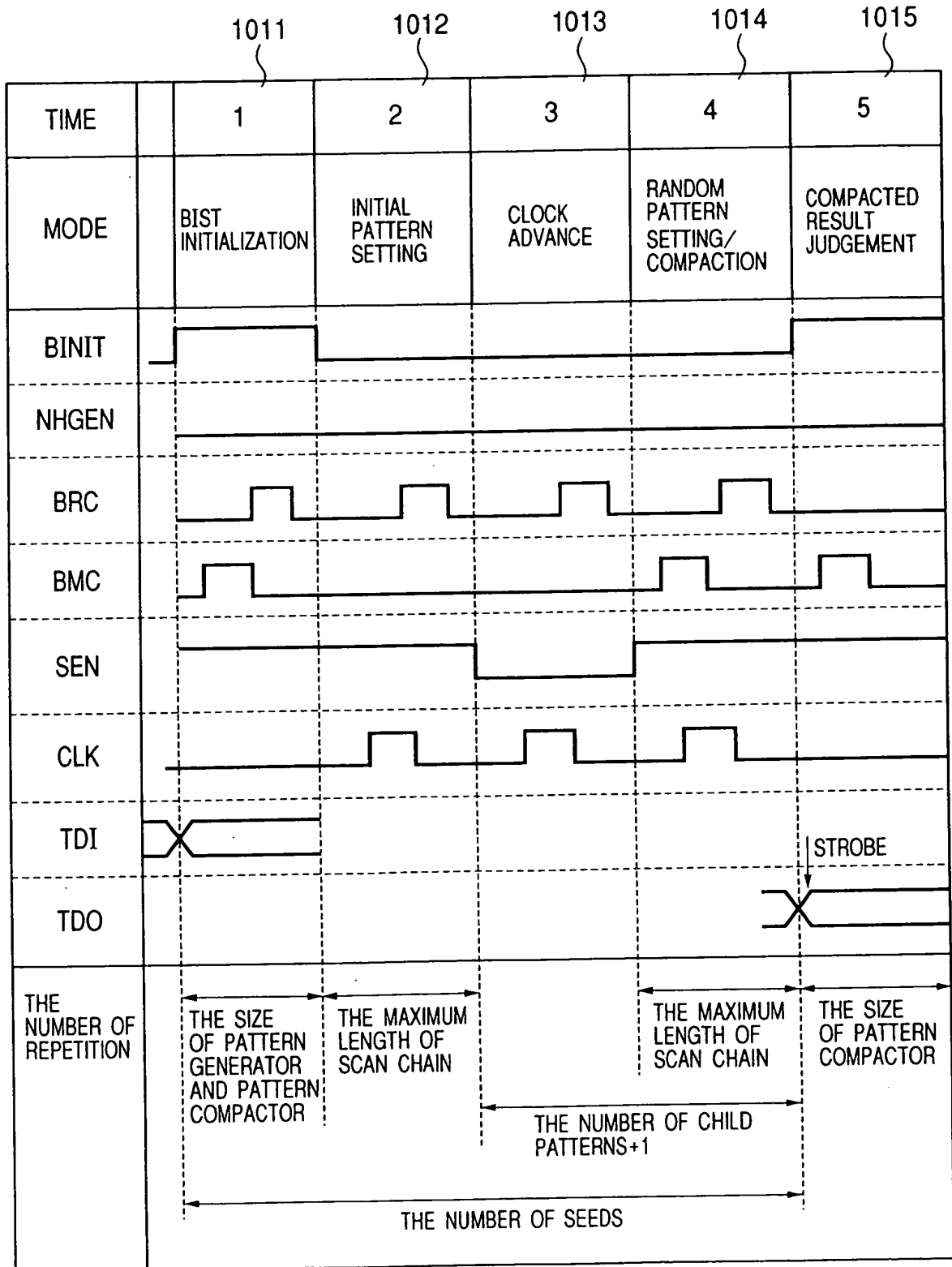
FIG. 21

FIG. 22



| | | | | | | | | | | | |
|------|------|------|------|------|------|------|------|------|------|------|------|
| 1021 | 1022 | 1023 | 1024 | 1025 | 1026 | 1027 | 1028 | 1029 | 1030 | 1031 | 1032 |
|------|------|------|------|------|------|------|------|------|------|------|------|

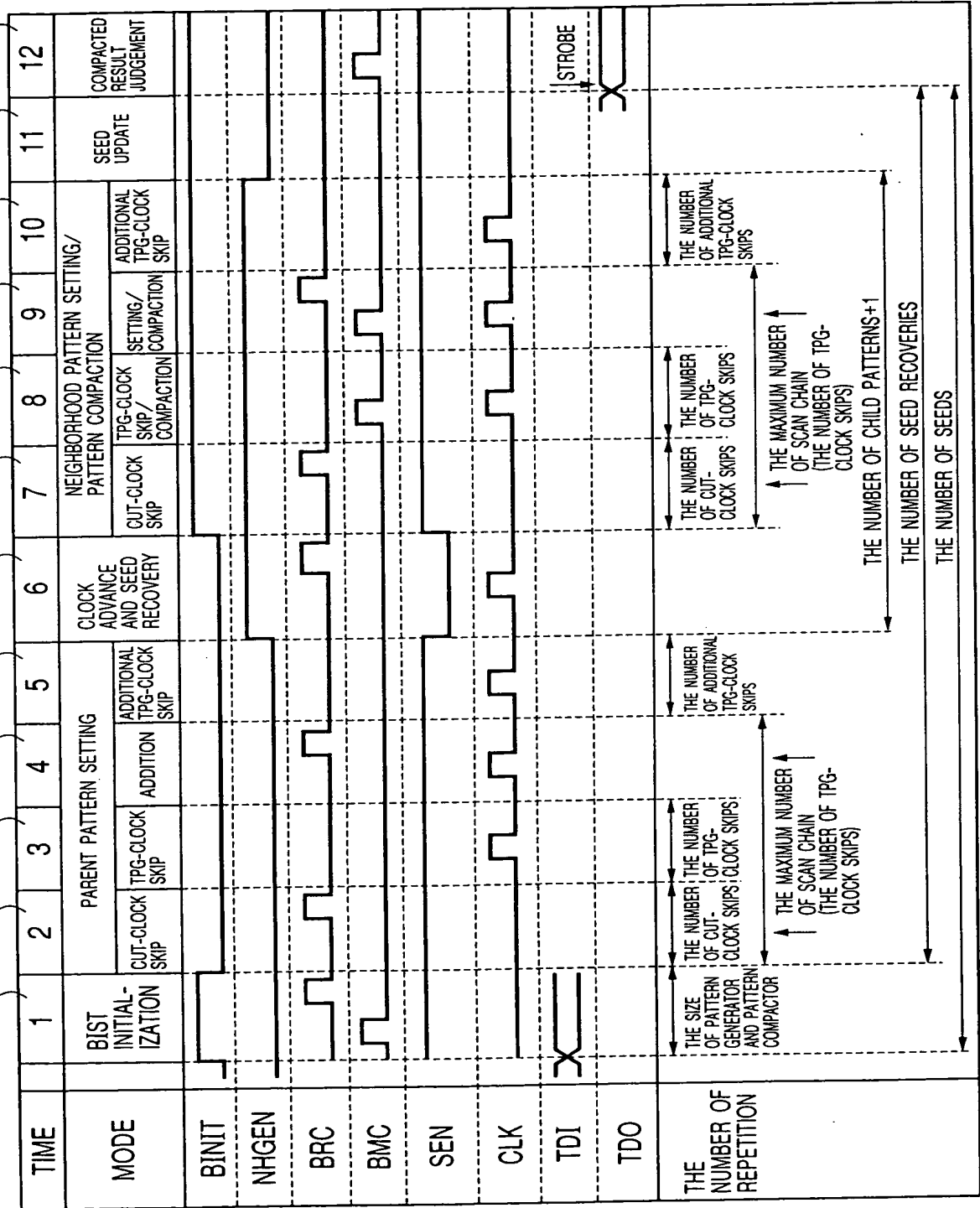


FIG. 24

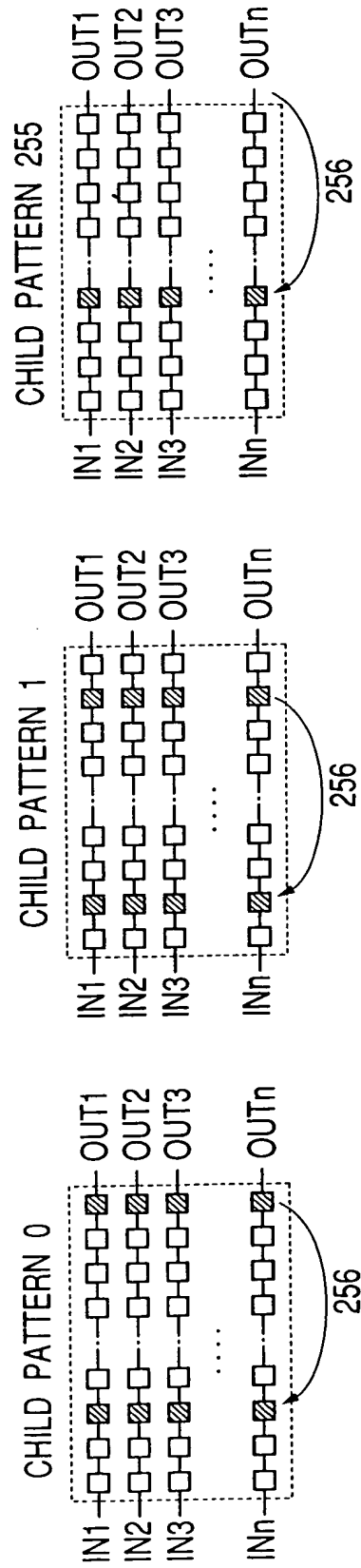


FIG. 25

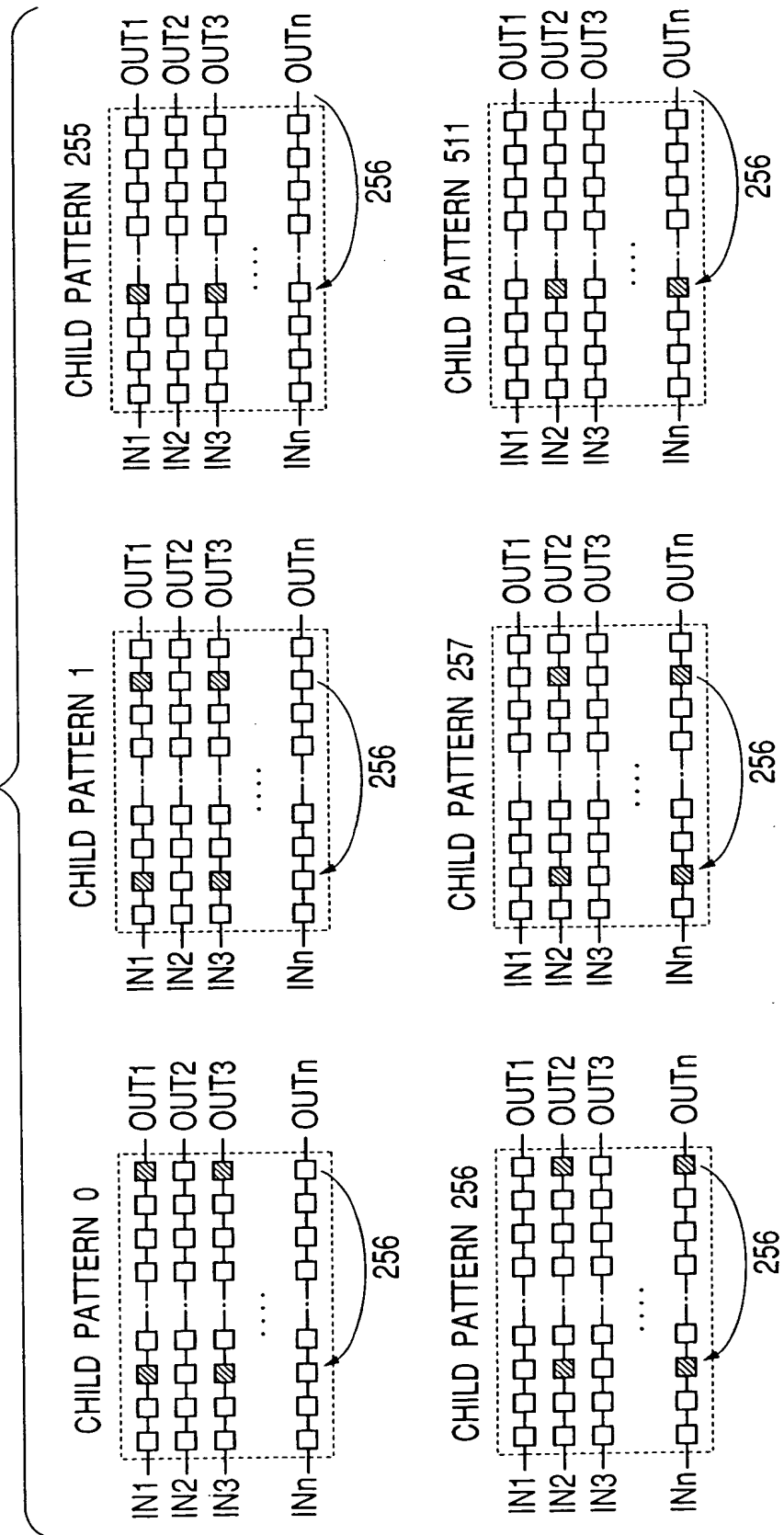


FIG. 26

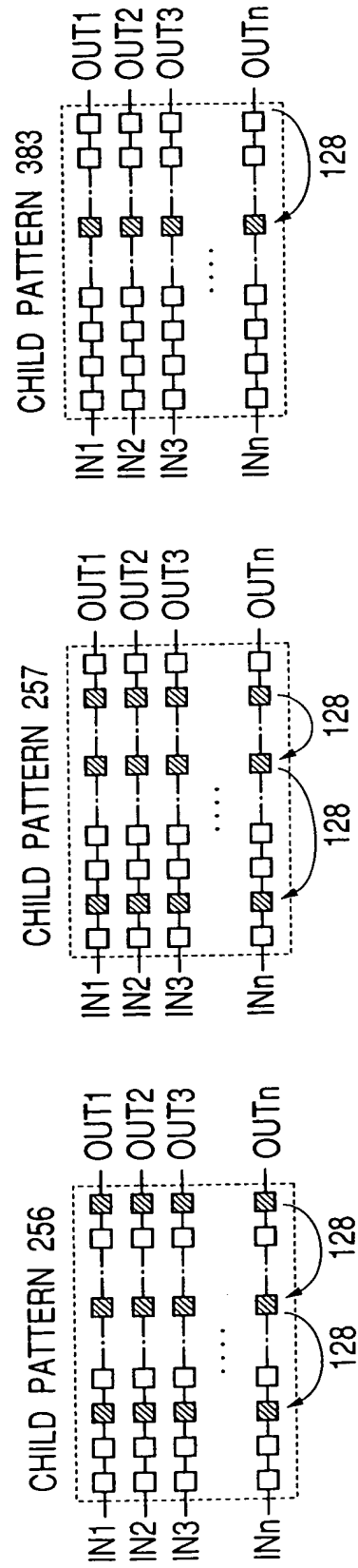
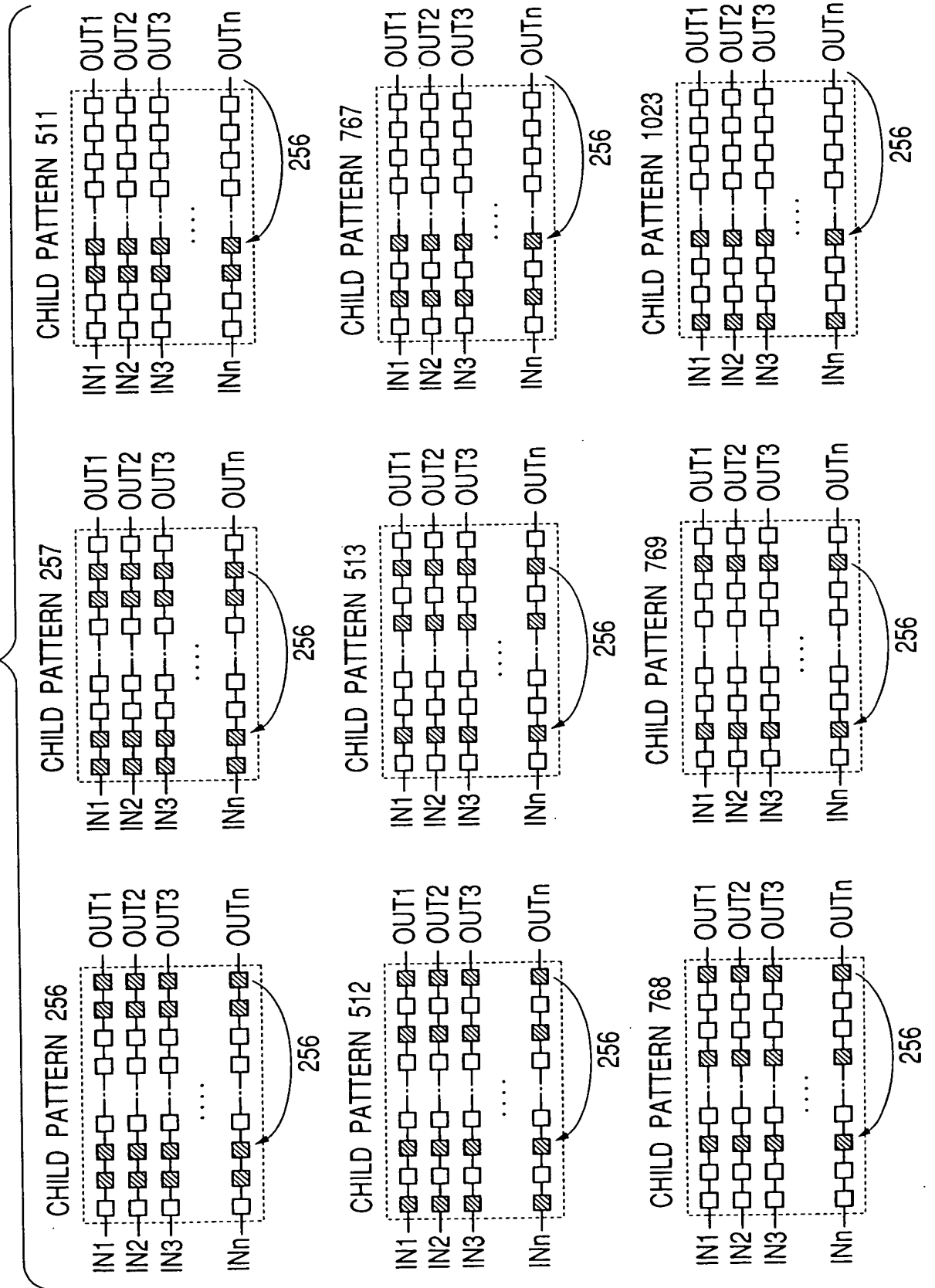
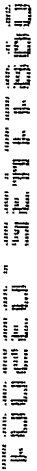


FIG. 27



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1. The first part of the document is a list of references. The references are listed in a standard format, with the author's name, the title of the work, and the publisher. The references are as follows:

1. The first part of the document is a list of references. The references are listed in a standard format, with the author's name, the title of the work, and the publisher. The references are as follows:

FIG. 29

| TIME | MODE | BI NIT | NH GEN | BRC | SEN | CLK | TDI | FBI EN | PG1 | PG2 | PG3 | PG4 | LC1 | LC2 | LC3 | HC1 | HC2 | HC3 | |
|------|--|-----------|-----------|-----|-----|-----|-----|-----------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|
| 0 | INITIALIZATION | 0 | 0 | 0 | 1 | 0 | 1 | X | X | X | X | X | X | X | X | X | X | X | |
| 1 | | 1 | 0 | P | 1 | 0 | 1 | 1 | X | X | X | X | X | X | X | X | X | X | |
| 2 | | 1 | 0 | P | 1 | 0 | 1 | 1 | 1 | X | X | X | X | X | X | X | X | X | |
| 3 | | 1 | 0 | P | 1 | 0 | 0 | 1 | 1 | 1 | X | X | X | X | X | X | X | X | |
| 4 | | 1 | 0 | P | 1 | 0 | 0 | 0 | 1 | 1 | 1 | X | X | X | X | X | X | X | |
| 5 | | 1 | 0 | P | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | X | X | X | X | X | |
| 6 | | 1 | 0 | P | 1 | 0 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | X | X | X | X | |
| 7 | | 1 | 0 | P | 1 | 0 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | X | X | X | |
| 8 | | 1 | 0 | P | 1 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 1 | 1 | X | X | X |
| 9 | | 1 | 0 | P | 1 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | 1 | X | X |
| 10 | | 1 | 0 | P | 1 | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | X |
| 11 | 1 | 0 | P | 1 | 0 | X | 0 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | |
| 12 | PARENT PATTERN SETTING | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 13 | | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 14 | | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 15 | | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 16 | | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 17 | | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 18 | | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 19 | | 0 | 0 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 20 | CLOCK ADVANCE | 0 | 1 | P | 0 | P | X | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 21 | CHILD PATTERN 0 SETTING (RESULT OF PARENT PATTERN) | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 22 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 23 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 24 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 25 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 26 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 27 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 28 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | |
| 29 | CLOCK ADVANCE | 0 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 | |
| 30 | CHILD PATTERN 1 SETTING (RESULT OF CHILD PATTERN 0) | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 31 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 32 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 33 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 34 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 35 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 36 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 | 0 | |
| 37 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 | 0 |
| 38 | CLOCK ADVANCE | 0 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | |
| | | | | | | | | | | | | | | | | | | | |
| 83 | CLOCK ADVANCE | 0 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 | |
| 84 | CHILD PATTERN 7 SETTING (RESULT OF CHILD PATTERN 6) | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 85 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 86 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 87 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 88 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 89 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 90 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 1 | 1 | |
| 91 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 1 | 1 |
| 92 | CLOCK ADVANCE | 0 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | |
| 93 | RESULT OF CHILD PATTERN | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 94 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 95 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 96 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 97 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 98 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 99 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| 100 | | 1 | 1 | P | 1 | P | X | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |

FIG. 30

| TIME | MODE | y0 | x1 | x2 | x3 | x4 | x5 | x6 | x7 | x8 | o1 | o2 |
|------|---|----|----|----|----|----|----|----|----|----|----|----|
| 0 | INITIALIZATION | X | X | X | X | X | X | X | X | X | X | X |
| 1 | | X | X | X | X | X | X | X | X | X | X | X |
| 2 | | X | X | X | X | X | X | X | X | X | X | X |
| 3 | | X | X | X | X | X | X | X | X | X | X | X |
| 4 | | X | X | X | X | X | X | X | X | X | X | X |
| 5 | | X | X | X | X | X | X | X | X | X | X | X |
| 6 | | X | X | X | X | X | X | X | X | X | X | X |
| 7 | | X | X | X | X | X | X | X | X | X | X | X |
| 8 | | X | X | X | X | X | X | X | X | X | X | X |
| 9 | | X | X | X | X | X | X | X | X | X | X | X |
| 10 | | X | X | X | X | X | X | X | X | X | X | X |
| 11 | | X | X | X | X | X | X | X | X | X | X | X |
| 12 | PARENT PATTERN SETTING | 1 | 1 | X | X | X | X | X | X | X | X | X |
| 13 | | 1 | 1 | 1 | X | X | X | X | X | X | 1 | X |
| 14 | | 1 | 1 | 1 | 1 | X | X | X | X | X | 1 | X |
| 15 | | 1 | 1 | 1 | 1 | 1 | X | X | X | X | 1 | X |
| 16 | | 1 | 1 | 1 | 1 | 1 | 1 | X | X | X | 1 | X |
| 17 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X | X | 1 | X |
| 18 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X | 1 | X |
| 19 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X |
| 20 | CLOCK ADVANCE | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | X |
| 21 | CHILD PATTERN 0 SETTING (RESULT OF PARENT PATTERN) | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 22 | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 23 | | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 24 | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 25 | | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 26 | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 27 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 28 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 |
| 29 | CLOCK ADVANCE | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 30 | CHILD PATTERN 1 SETTING (RESULT OF CHILD PATTERN 0) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 31 | | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 32 | | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 33 | | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 34 | | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 1 |
| 35 | | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 | 1 |
| 36 | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 | 1 |
| 37 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 1 | 1 |
| 38 | CLOCK ADVANCE | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 83 | CLOCK ADVANCE | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 84 | CHILD PATTERN 7 SETTING (RESULT OF CHILD PATTERN 6) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 |
| 85 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 86 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 87 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 88 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 89 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 90 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 91 | | 0 | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 92 | CLOCK ADVANCE | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 1 |
| 93 | RESULT OF CHILD PATTERN | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 94 | | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 95 | | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 96 | | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 1 | 0 |
| 97 | | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| 98 | | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 1 | 0 |
| 99 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 100 | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 | 1 | 0 |

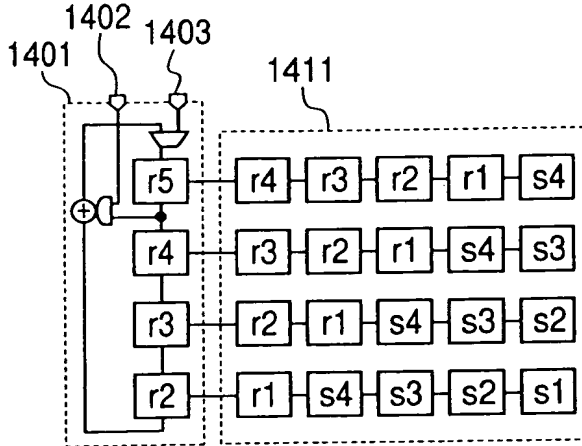
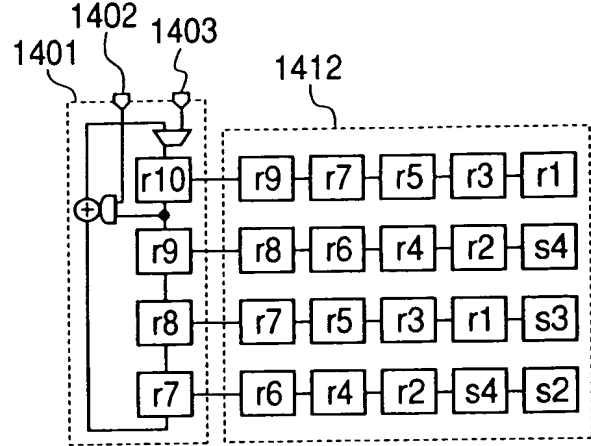
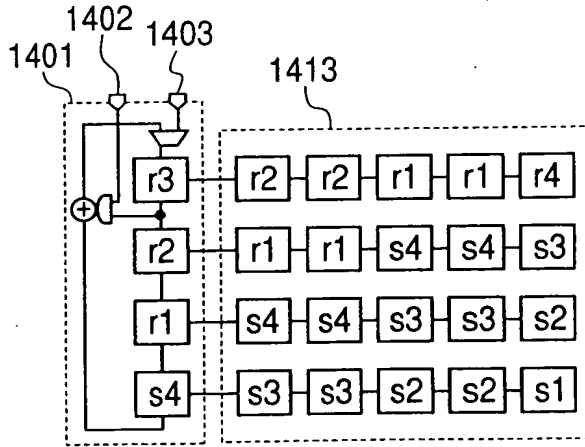
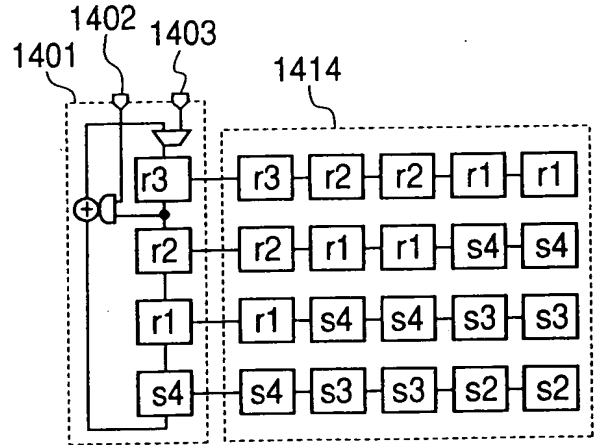
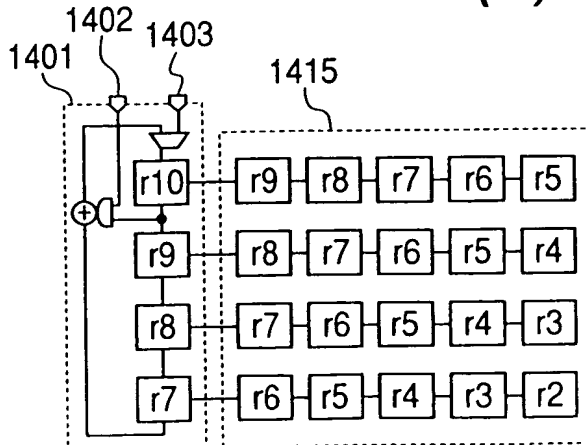
FIG. 31(a)*FIG. 31(b)**FIG. 31(c)**FIG. 31(d)**FIG. 31(e)*

FIG. 32(a)

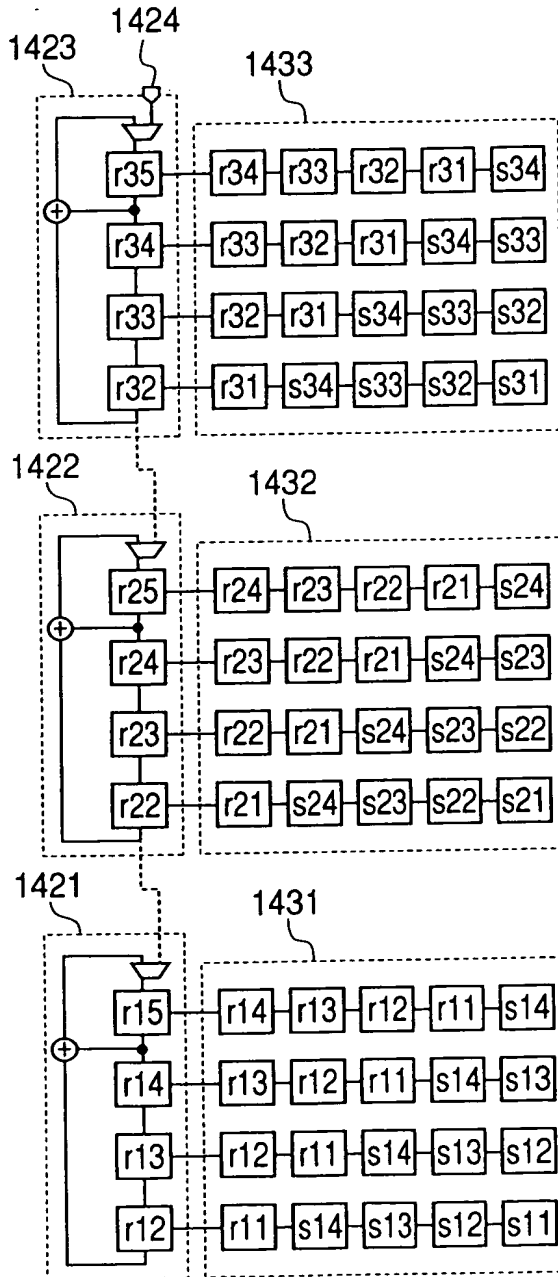


FIG. 32(b)

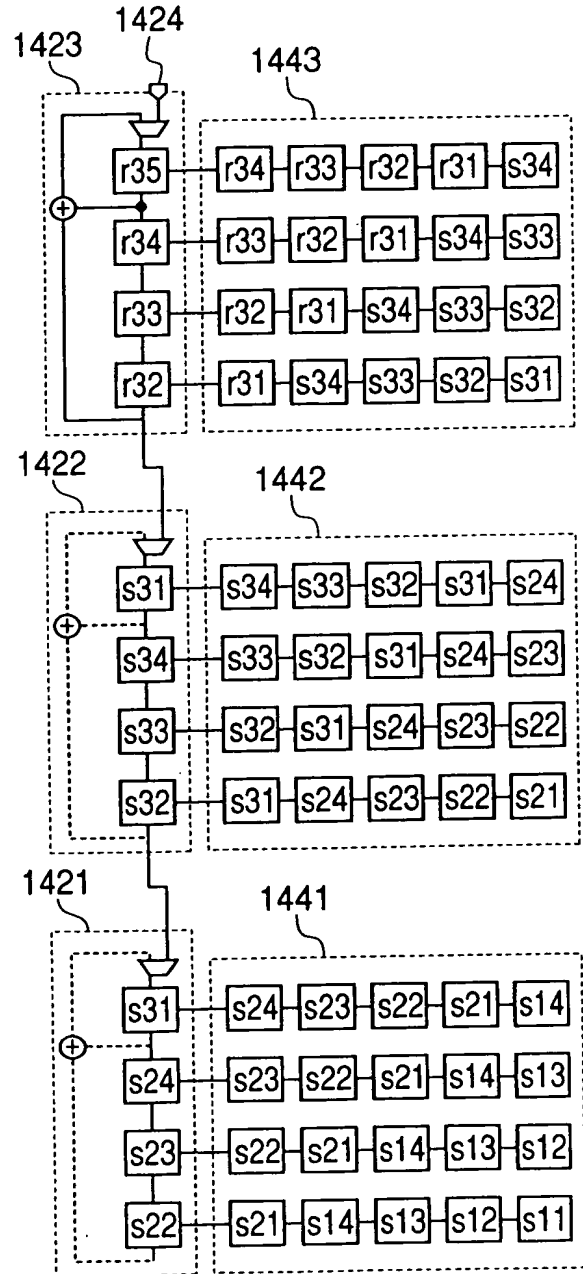


FIG. 33

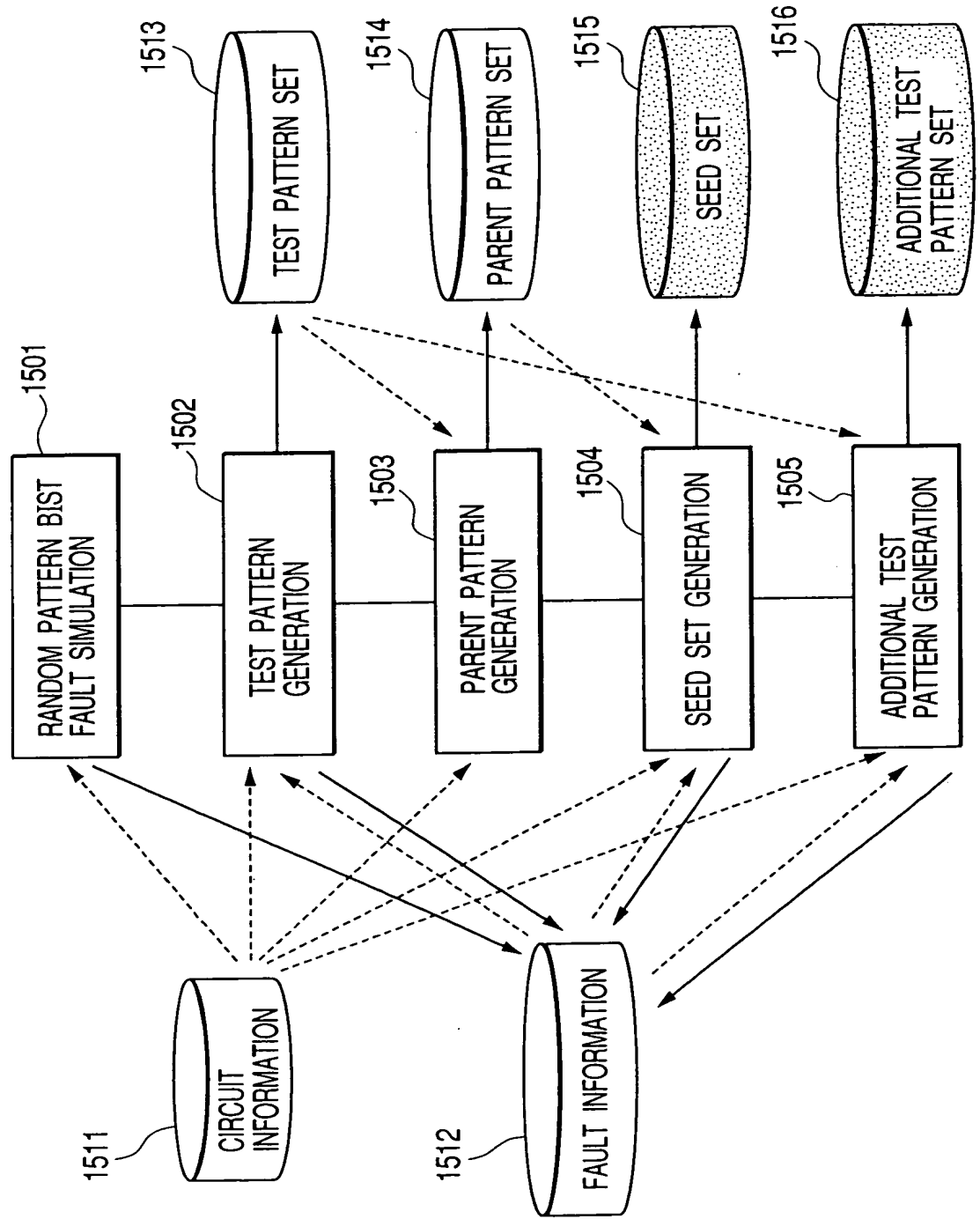


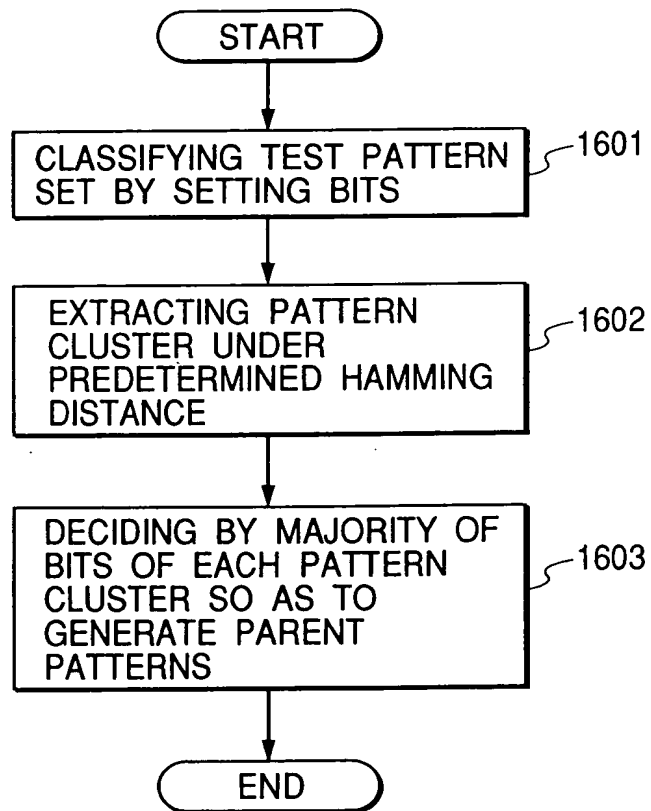
FIG. 34

FIG. 35

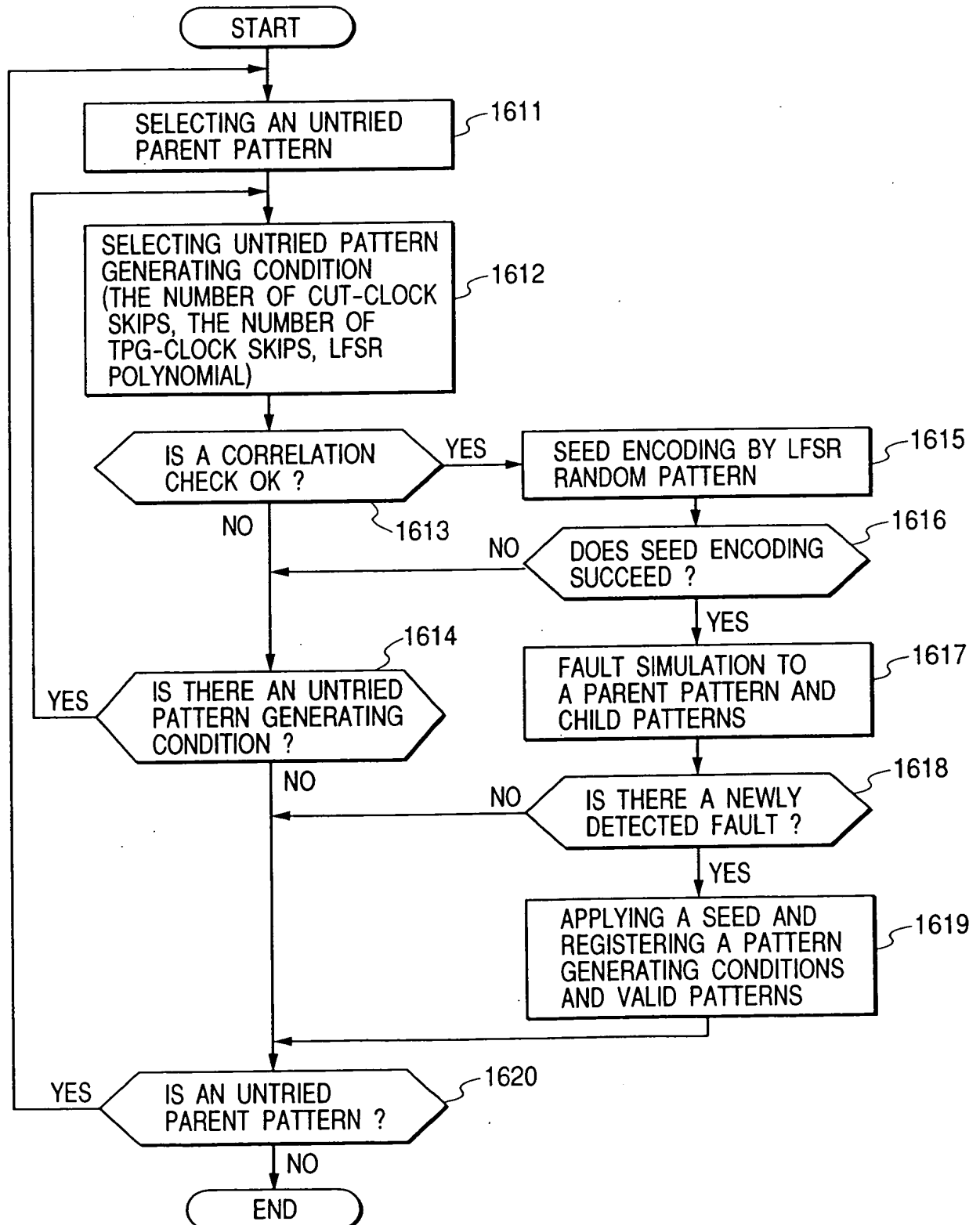


FIG. 36

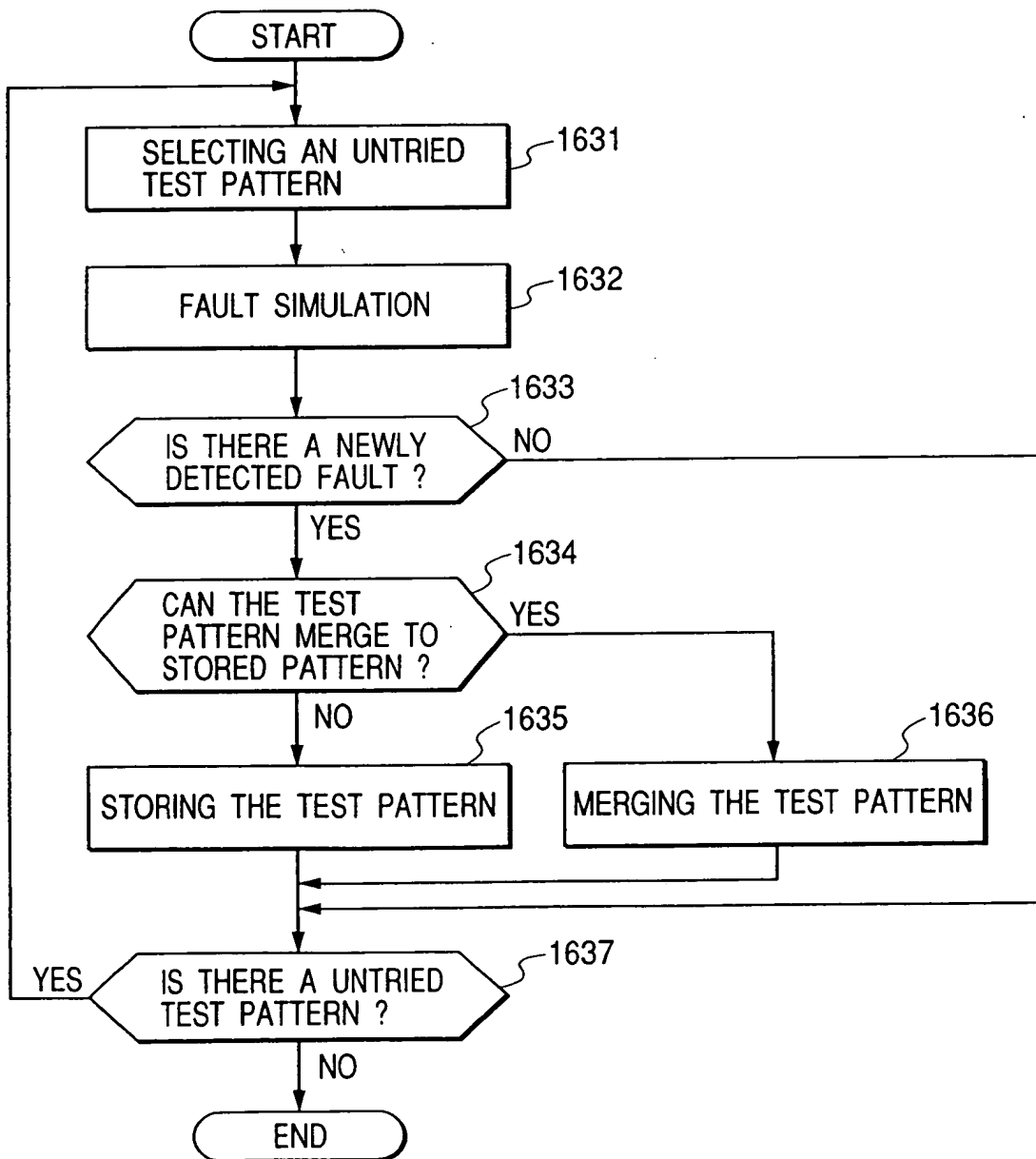


FIG. 37

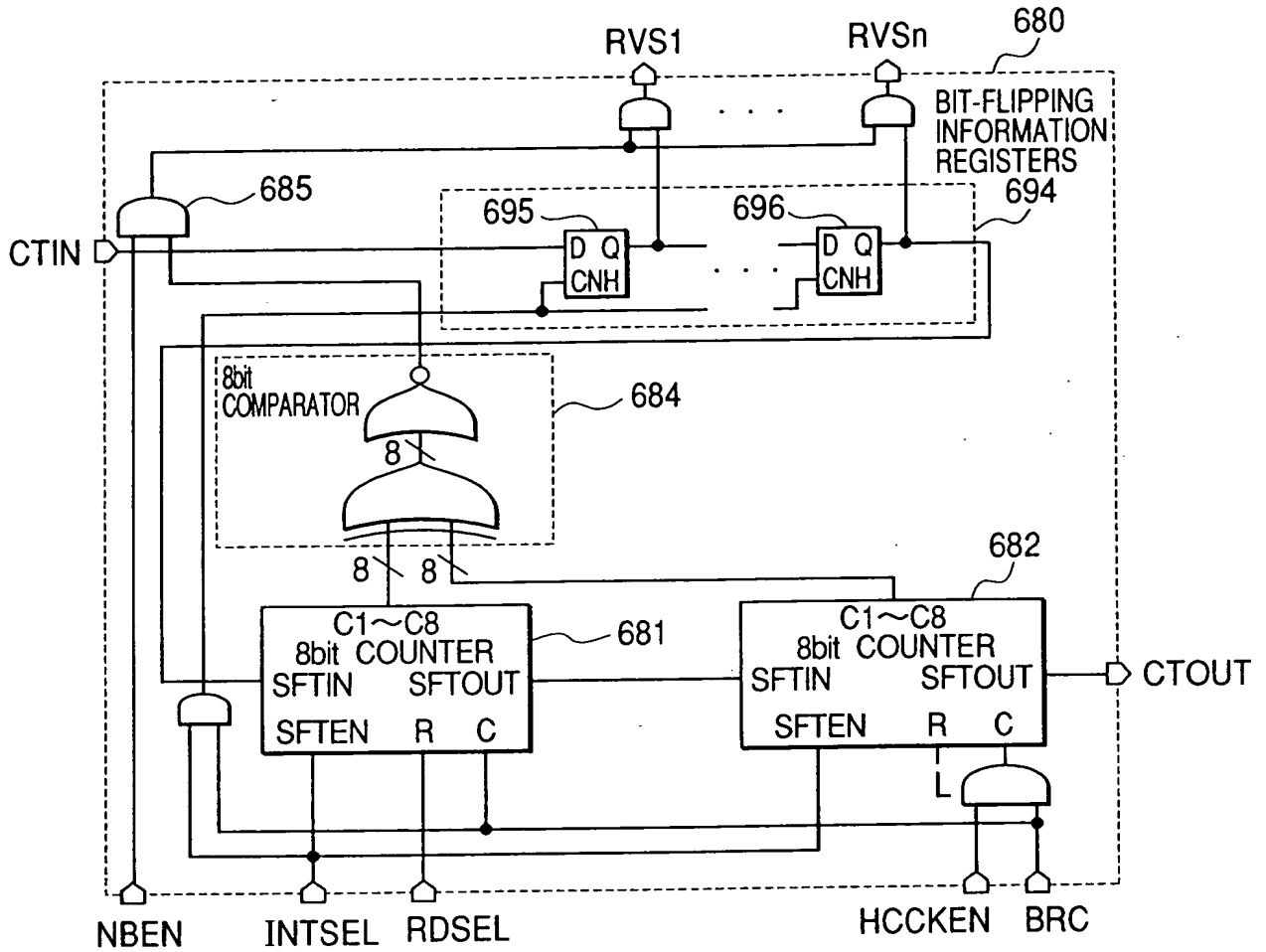


FIG. 38

